A McGraw-Hill Publication

Power

Plant electrical systems

Distribution designers aim for greater efficiency, higher reliability . . . . . page 23
Added safety and protection built into cables, supports, terminations . . . . page 27
Speed and simplicity stressed in busway installation . . . . . page 28

Mechanical transmission and lubrication

Measure drive backlash and flexibility to back up your calculations . . . . . page 51
Lubrication basics give insight into gear and bearing performance . . . . . page 53

Instrumentation and control

A well-organized control room is the key to top operation . . . . . page 55
Understand terminology used in measuring radiation levels . . . . . page 58

Steam generation

The practice of boiler rental: Is it practical for your needs? . . . . . page 64
Ready-reference guide for today's industrial burners . . . . . page 65

Environmental management

Desulfurization of flue gas still a long way off . . . . . page 68
Congress on the trail of pollution standards for central stations . . . . . page 70

Fluid handling

Lessons learned at Boeing in adding high-pressure air compressors . . . . . page 76

Heating and cooling

Desalting water with heat from a tripurpose nuclear plant . . . . . page 79
All-electric high school in Wisconsin will be the largest yet . . . . . page 82

Prime movers and generators

Compressed-air storage extends peak periods for gas turbines . . . . . page 90
Turbogenerator shafts reach for the 1000-MW mark—and beyond . . . . . page 94

Editorial Index

Volume 113 January-December 1969

McGraw-Hill, Inc., 330 West 42nd Street
New York, N.Y. 10036

A

AIR COMPRESSORS, SYSTEMS
Accessories: key to optimizing air systems. A.A. Kellstrom — May — 86
A compressor that wouldn't compress. A. M. Robbins (P.I.) — Nov. — 158
Is your turbocharged engine working at peak efficiency? W.M. Kauffmann (chart) — Feb. — 63
"Look Maw, no compressor". C. Dandrow (P.I.) — Feb. — 148
Use right check valve. H. O. Tibbitts. (P.I.) — Nov. — 159

AIR CONDITIONING
Beware of hydrogen gas. J.P. Snow (P.I.) — Aug. — 158
Design trends in industrial air conditioning: worker comfort; clean rooms; heat-recovery systems — 8-page design report. T.C. Elliott (charts) — Apr. — 197
Environmental control system from Sweden can be economical (chart) — Jan. — 73
How can we maintain rooftop package a-c units? — Energy system problem — Nov. — 156
1969 Energy Systems Design Survey (charts & tables)
As costs soar, designers turn to all-electric and all-fuel energy systems — Oct. — S-33
Design features — Oct. — S-34

AIR POLLUTION CONTROL
Can the cost of SO_2 pollution control be reduced? Boyer & Kaylor (chart) — Apr. — 81
Check stack size during fuel conversion. C.M. Sallman (chart) — July — 57
Computer simulates urban atmospheres. Boyer & Kaylor (charts) — July — 60
How much pollutant is discharged? R.W. Gerstle (charts & table) — Jan. — 63
Man and his environment — 24-page special report (charts & tables) — Oct. — 53
Air pollution: where are we heading? — Oct. — 54
Odors — more nuisance than health threat. T. C. Elliott — Oct. — 64
Radioactivity: burden from a boon. S.D. Strauss — Oct. — 66
Simple smog control leaves auto advisors red-faced! — Aug. — 59
Successful incinerators are not cheap. E.R. Kaiser — Sept. — 78
Tackling the problem of nitrogen oxides. Mantia & Field (charts & tables) — Apr. — 63
TEPCO to use LNG for its new plants — Dec. — 63
When 'further study' is a camouflage (Ed.) — Nov. — 39

Atomic Power see Nuclear Power

B

BEARINGS
Motors — 32 page special report. Norman Peach (charts & tables) — June — S-1
Now our bearings last. C. Milster (P.I.) — Aug. — 158

BOILERS
Can a superheater "baffle" cause a hot spot? — Energy system problem — Sept. — 178
Changing from coal to oil or gas? R. W. Marshall (table) — Dec. — 62
Check stack size during fuel conversion. C. M. Sallman (chart) — July — 57
Continuous demineralizing for boiler feed. Charles Thorborg (tables) — June — 76
Guide to combustion-air preheating. A. W. Hein (chart) — Sept. — 70
Industrial boilers — 8-page TD report. R.J. Bender (charts & table) — May — 199
Inspect packaged boilers on a system basis: boiler-code standards should include controls. A.L. Kohan — Mar. — 84
Look out, take care. J. G. Reed (P.I.) — July — 166
Proper water treatment for industrial boilers cuts failures, reduces downtime. L.H. Vaughan (charts & table) — Nov. — 47
Recirculation problem solved with air-operated valves. P. Hahn (P.I.) — June — 176
Unfired generator meets new steam demand. R.N. Clarke & others — Jan. — 76
Watch how you test. T. A. Stewart (P.I.) — Sept. — 180
We stopped wasting steam from our sump. C. Milster (P.I.) — Sept. — 182
What causes this b-f pump to draw excessive power? — Energy system problem — Dec. — 154
What was wrong with No. 4 boiler? J. G. Reed (P.I.) — Apr. — 183
Why did our boiler lose capacity? B. Zetchus (P.I.) — Feb. — 147

C

CANADA
Northern Canada Power Commission
Achievements (1948-1967) in developing power plants in remote northern areas. Steve Elonka (map & table) — Apr. — 72
A cold winter is NCPC's biggest enemy. Steve Elonka — Sept. — 65

CENTRAL POWER STATIONS
Canada: Northern Canada Power Commission
Achievements (1948-1967) in developing power plants in remote northern areas. Steve Elonka (map & table) — Apr. — 72
A cold winter is NCPC's biggest enemy. Steve Elonka — Sept. — 65
Conemaugh generating station: Fiber-glass pipe goes underground — June — 80
1969 Energy Systems Design Survey (charts & tables) — Oct. — S-1
Fossil-fueled central stations: Planners, designers are concerned about degradation of the environment — Oct. — S-2
Nuclear-powered central stations: Design features — Oct. — S-10
Delays cut U.S. reactor orders. Europe expands technology — Oct. — S-12
Central station capital costs swing upward — Oct. — S-48
PASNY stretches for new loads. Robert G. Schwieger (map & table) — Nov. — 50
Westinghouse supplies on-site power for Garden State Paper Co. plant at Pomona, Cal. G. E. Baker — Dec. — 43

CIRCUIT BREAKERS
Short-circuit calculations. Irwin Lazar (charts & tables)
Fundamental considerations of fault calculation — Feb. — 74
How short-circuit currents behave — Apr. — 76
How to apply the per-unit method to short-circuit current calculations (tables) — Aug. — 72

COAL AND ASH HANDLING
Air pollution see **Air Pollution Control**
Changing from coal to oil or gas? R. W. Marshall (table) — Dec. — 62
Coal contracting: Outlook for long-term coal contracts — July — 53
Here's that fly ash again, boosting temperatures. J. G. Reed (P.I.) — June — 176
How can we identify fly ash? — Energy system problem — June — 172
No slips now. T. Stafford (P.I.) — Sept. — 180
Shutters cut off our coal supply. A. Cupello (P.I.) — Jan. — 150
What causes clinkers in the ash hoppers? — Energy system problem — Mar. — 178

COMBUSTION
Changing from coal to oil or gas? R. W. Marshall (table) — Dec. — 62
Guide to combustion-air preheating. A. W. Hein (chart) — Sept. — 70

COMPUTERS
Computer simulates urban atmospheres. Boyer & Kaylor (charts) — July — 60
Managing nuclear fuel — 16-page special report. R.G. Schwieger (charts & tables) — Dec. — S-1
Modern training techniques — 8-page TD report. R.J. Aberbach — Feb. — 161
Research helps cut Britain's power costs. R.K. Evans — Dec. — 60

CONDENSERS, STEAM
Water consumption ratio in barometric condensers. A. Zanker (Data Sheet) (nomograph) — Nov. — 104

CONSTRUCTION
Cellular-glass insulation can save money in underground steam and return piping. L.M. Applegate — Nov. — 59
Lead, a versatile and flexible noise-cutting aid — Aug. — 62
Machine taps in butterfly valves on-line — Dec. — 46
Man and his enviroment — 24-page special report (charts & tables) — Oct. — 53
Our visual setting — changes for the better. T. C. Elliott — Oct. — 64
Motorola plant built in modules has added flexibility. R. E. Sullivan — Sept. — 74
Plan well for a nuclear operating license. G.K. Rhode (tables) — Sept. — 76
Six-second blast topples stack in carefully measured falls: pre-shooting did the trick. — Sept. — 67

Controls see Instruments and Controls

COOLING TOWERS
Add dry surface to cooling towers to increase capacity. Buss & Tremont (charts & tables) — May — 79
How can we stop cooling-tower corrosion-inhibitor pollution? — Energy system problem — Sept. — 176
How to improve cooling tower efficiency. R. Burger (charts) — Feb. — 67
Man and his environment — 24-page special report (charts & tables) — Oct. — 53
Thermal effects compound the overall problem. R. J. Aberbach — Oct. — 60
Research helps cut Britain's power costs. R.K. Evans — Dec. — 60
Winterize cooling towers with electric heat. M. Epstein (charts & tables) — Jan. — 59

CORROSION
Cellular-glass insulation can save money in underground steam and return piping. L.M. Applegate — Nov. — 59
Fiber-glass pipe goes underground — June — 80
How can we stop cooling-tower corrosion-inhibitor pollution? — Energy system problem. — Sept. — 176
Polyelectrolytes clear up mud problem at Ohio Steel Mill (chart) — Dec. — 55

D

DATA SHEETS (A DEPT)
Frame numbers for 3-phase a-c motors. P.A. Werkheiser (table) — May — 124
Glossary of water and waste engineering terms Pt. 1 July 116, Pt. 2 Aug. 110, Pt. 3 Sept. 106, Pt. 4 — Oct. — 134
How to determine pump horsepower and type. H.W. Hamm (nomogram) — Jan. — 100
Hydraulic-turbine horsepower and type. H.W. Hamm (nomograph) — Feb. — 100
Mounting data for 3-phase ac motors. P.A. Werkheiser (chart) — June — 118
Plant fuel cost per kW of capacity. N. Savage (chart) — Mar. — 116
Rejected-heat effect on stream temperature. P.W. Viscovich (chart) — Apr. — 134
Resistance of a conductor. W. Sisson (nomograph) — Dec. — 92
Water consumption ratio in barometric condensers. A. Zanker (nomograph) — Nov. — 104

E

ECONOMICS
Can the cost of SO_2 pollution control be reduced? Boyer & Kaylor (chart) — Apr. — 81
Continuous exchange cuts soft-water cost. Gerald Alexander (chart) — Jan. — 74
Desalination — why water desalting will expand — 8 page TD report. R.J. Bender (charts) — Aug. — 171
European industry aims for worldwide markets — 8-page management report. R. K. Evans — Nov. — 177
Recovery turbines enhance economics of gas-washing plants. Schneider & Franzke — Sept. — 68
The significance of size The engineer's skill and people-size problems (Ed.) — May — 61
"Six-tenths" factor gives cost change. J.D. Constance (chart) — Sept. — 89

EDITORIALS
Doing business with energy-systems engineers — Apr. — 59
How did we fare in the '60's? — Dec. — 39
How will you manage tomorrow? — June — 67
Labor amid the challenge of boom — Feb. — 55
Nuclear safety can be overplayed — Aug. — 53
POWER's Central-Engineering Seminars — Jan. — 55
The significance of size — May — 61
Synthetics' dual role in lubrication — Sept. — 59
The threat of arcing faults — July — 49
Utilities reveal 10-year growth figures — NEMA survey — Mar. — 67
What prods the systems designer? — Oct. — 49
When 'further study' is a camouflage — Nov. — 39

ELECTRIC GENERATION
Another check point. R.J. Neiert (P.I.) — Sept. — 182
Can the fuel cell bridge the gap? R. J. Bender (charts) — July — 70
Class F rating for industrial generators. P. L. Cochran (charts & tables) — Mar. — 86
European industry aims for worldwide markets — 8-page management report. R.K. Evans — Nov. — 177
Japan's programs for nuclear electric power through 1976. W.J. McCool (table, map) — Mar. — 78
Let's take a look at power factor. J. Alacchi (charts) — Dec. — 52
Magnetohydrodynamics power plant nears completion — Russia's 75-MW plant near Moscow. R.K. Evans (chart) — Jan. — 66
Man and his environment — 24-page special report (charts & tables) — Oct. — 53
Thermal effects compound the overall problem. R.J. Aberbach — Oct. — 60
1969 Energy Systems Design Survey (charts & tables) — Oct. — S-48
Probability mathematics can be used to evaluate power-system reliability. Norton Savage (chart & tables) — May — 72
Research helps cut Britain's power costs. R.K. Evans — Dec. — 60
Transient and dynamic stability studies. Lokay & Merry (charts) — Aug. — 66
Utilities reveal 10-year growth figures — NEMA survey (Ed.) — Mar. — 67
Westinghouse supplies on-site power for Garden State Paper Co. plant at Pomona, Cal. G.E. Baker — Dec. — 43
What caused the slip ring to burn? — Energy system problem — Feb. — 144

ELECTRIC POWER DISTRIBUTION
Arcing faults — take a fresh look at arcing faults. W.F. Bennett (chart) — Feb. — 59

Double-end-weld penetration assemblies upgrade reactor containment reliability. D.K. Sorensen Sept. — 72
European industry aims for worldwide markets — 8-page management report. R.K. Evans Nov. — 177
How uninterrupted-power systems shape up at US Navy shore installations. J.B. Driscoll Sept. — 63
Let's take a look at power factor. J. Alacchi (charts) Dec. — 52
1969 Energy System Design Survey (charts & tables)
Trends in electric system design reflect use of modern techniques Oct. — S-40
Design features Oct. — S-42
PASNY stretches for new loads. Robert G. Schwieger (map & table) Nov. — 50
Research helps cut Britain's power costs. R.K. Evans Dec. — 60
Resistance of a conductor. W. Sisson (Data Sheet) (nomograph) Dec. — 92
Short-circuit calculations. Irwin Lazar (charts & tables)
Fundamental considerations of fault calculation Feb. — 74
How short-circuit currents behave Apr. — 76
How to apply the per-unit method to short-circuit current calculations Aug. — 72
Calculating industrial short-circuit currents Dec. — 56
Speed changer inoperative — What would you have done? P.S. Finneral P.I.) May — 181
The threat of arcing faults (Ed.) July — 49

ELECTRIC SYSTEM FILE (A DEPT.)
Consider infrared for comfort heating July — 162
Electric heating has many applications Jan. — 144
Electric heating offers many techniques May — 176
Electromechanical brakes are reliable Dec. — 150
How to control electric heating Sept. — 174
Resistance heating units are adaptable Mar. — 174

ELECTRONICS
Why growth of ac adjustable speed? D.F. Grubb (charts & table) Nov. — 43

ENERGY
Can the fuel cell bridge the gap? R.J. Bender (charts) July — 70

ENERGY SYSTEMS DESIGN
Arcing faults: a fresh look. W.F. Bennett (chart) Feb. — 59
Can a superheater "baffle" cause a hot spot? Sept. — 178
Design trends in industrial air conditioning — 8-page design report. T.C. Elliot (charts) Apr. — 197
Doing business with energy-systems engineers (Ed.) Apr. — 59
How can we stop cooling-tower corrosion-inhibitor pollution? Sept. — 176
Industrial boilers — 8-page TD report. R.J. Bender (charts & tables) May — 199
Making a storage pool leak-tight at Niagara Mohawk's Nine Mile Point Feb — 79
1969 Energy systems Design Survey (charts & tables) Oct. — S- 1
Fossil-fueled central stations Oct. — S- 2
Nuclear-powered central stations Oct. — S- 8
Oil and gas engines: a worldwide survey Oct. — S-13
Gas turbines: industrial, utility Oct. — S-20
Industrial steam systems Oct. — S-26
Industrial steam-turbine electric generation Oct. — S-32
Air conditioning: commercial, industrial Oct. — S-33
In-plant electric power distribution Oct. — S-40
How are costs shaping up? Oct. — S-48
POWER's Central-Engineering Seminars (Ed.) Jan. — 55
POWER's Central-Engineering Seminar probes plans and problems — 8-page EM report. R.K. Evans (chart) Jan. — 165
Probability mathematics can be used to evaluate power-system reliability. Norton Savage (chart & tables) May — 72
Quality assurance assures quality in nuclear and other installations: a job for specialists. E.M. Marselli (chart) Apr. — 82
Transient and dynamic stability studies. Lokay & Merry (charts) Aug. — 66

ENERGY SYSTEMS PROBLEMS (A DEPT.)
Can a superheater "baffle" cause a hot spot? Sept. — 178
How can a poor closed-circuit TV image be improved? July 8 164
How can we check accumulators? Mar. — 176
How can we identify fly ash? June — 172
How can we maintain rooftop package a-c units? Nov. — 156
How can we seal off steam piping? May — 178
How can we stop cooling-tower corrosion-inhibitor pollution? Sept. — 176
How do you handle piping and equipment drawing changes? Aug. — 154
How do you heat incoming makeup air? Apr. — 180
Is lightning responsible for our transformer failures? Jan. — 146
What caused the slip ring to burn? Feb. — 144
What causes clinkers in the ash hoppers? Mar. — 178
What causes this b-f pump to draw excessive power? Dec. — 154
Why spotty wear on V-belt pulleys? June — 174

ENGINEERING PROFESSION
Central-Engineering Seminar probes plans and problems — 8-page EM report. R.K. Evans (chart) Jan. — 165
Doing business with energy-systems engineers (Ed.) Apr. — 59
How did we fare in the '60's? (Ed.) Dec. — 39
How will you manage tomorrow? (Ed.) June — 67
POWER's Central-Engineering Seminars — a brief history (Ed.) Jan. — 55
The significance of size: The engineer's skill and people-size problems (Ed.) May — 61
Training nuclear engineers: a fine theory-hardware mix. R.J. Aberbach Aug. — 57

ENGINES, INTERNAL COMBUSTION
Camshaft change for big engines. M.E. Foster (P.I.) Dec. — 160
Correcting engine alignment. W.R. Pender (P.I.) Dec. — 158
Is your turbocharged engine working at peak efficiency? W.M. Kauffmann (chart) Feb. — 63
Know bmep — the key to high engine output. W.M. Kauffmann (charts) Nov. — 56
1969 Energy Systems Design Survey (charts & tables)
Power, continuous or standby, leads in engine end use in survey Oct. — S-13
Design features Oct. — S-14
Standby diesels improve nuclear reactor safety. R.J. Bender (chart) May — 65
Verify engine alignment before operating. G.D. Pheil May — 81

EUROPE
European industry aims for worldwide markets — 8-page Management report. R.K. Evans Nov. — 177
Man and his environment — 24-page special report (charts & tables) Oct. — 53
Cooperation is the keynote for Europe's conservation agencies. R.K. Evans Oct. — 72
Nuclear fuel enrichment plants planned July — 56

F

FANS AND BLOWERS
Casing for draft fan - what would *you* have done? B. Zetchus (P.I.) Sept — 181

Feedwater see Water Conditioning

FILTRATION
User survey evaluates sidestream filters. R. Parlante (charts & table) Mar. — 75

FUELS
Can the fuel cell bridge the gap? R. J. Bender (charts) July — 70
Coal contracting: Outlook for long-term coal contracts July — 53
Cost of plant fuel per kW of capacity. N. Savage (Data Sheet) (charts) May — 116
Fueling small steamship - what would you have done? T. A. Stewart (P.I.) Dec. — 159
Managing nuclear fuel - 16 - page special report. R. G. Schwieger (charts & table) Dec. — S-1
The role of NGL in industry. W. W. Keeler (chart & table) Sept. — 82
Siberia's gas and oil fields are tougher than Alaska's. Jack Winkler Sept. — 84
TEPCO to use LNG for its new plants Dec. — 63

FURNACES
Cyclone furnace passes high-moisture tests. Duzy & Rusanowsky (chart) Feb. — 62

FUSES
Short-circuit calculations. Irwin Lazar (charts & table)
Fundamental considerations of fault calculation Feb. — 74
How short-circuit currents behave Apr. — 76
How to apply the per-unit method to short-circuit current calculations. (tables) Aug. — 72

G

GAS BURNING AND HANDLING
Changing from coal to oil or gas? R. W. Marshall (table) Dec. — 62
Is there an economical way to store liquefied natural gas? Jan. — 77
Recovery turbines enhance economics of gas-washing plants. Schneider & Franzke Sept. — 68
The role of NGL in industry. W. W. Keeler (chart & table) Sept. — 82
TEPCO to use LNG for its new plants Dec. — 63

Gas Turbines see Turbines, gas

GERMANY
German nuclear industry shows immense progress. Kurt Jaroschek (map) Jan. — 72

GREAT BRITAIN
Research helps cut Britain's power costs. R.K. Evans Dec. — 60

H

HEAT EXCHANGERS
Guide to combustion-air preheating. A.W. Hein (charts) Sept. — 70
Polyelectrolytes clear up mud problem at Ohio Steel Mill (chart) Dec. — 55
Replace cracked heat exchanger with dummy. R. Ward (chart) (P.I.) Apr. — 182

HEAT TRANSFER AND FLUID FLOW
Guide to combustion-air preheating. A.W. Hein (chart) Sept. — 70
Guidelines for central plant cooling. M.L. Hoglund (tables) June — 84
Industrial boilers - 8-page TD report. R.J. Bender (charts & table) May — 199
Rejected-heat effect on stream temperature. P.W. Viscovich (Data Sheet) (chart) Apr. — 134
Water hydraulic systems have their place. William O'Keefe Aug. — 60
Winterize cooling towers with electric heat. M. Epstein (charts & tables) Jan. — 59

HEATING AND VENTILATING
Consider infrared for comfort heating (charts) July — 162
Deaerator installation - Easy does it. M.L. Williams (P.I.) Feb. — 146
Electric heating has many applications. Norman Peach (charts) Jan. — 144
Electric heating offers many techniques. Norman Peach (charts) May — 176
Environmental control system from Sweden can be economical (chart) Jan. — 73
Harvard Medical Center: Compact water heaters sólve space problem July — 68
How do you heat incoming makeup air? - Energy system problem Apr. — 180
How to control electric heating. Norman Peach Sept. — 174
Keep stored water hot with poured-inplace insulation of underground storage tanks. J.A. Thompsen July — 58
Pipeline tracing with SECT may save money. D.F. Othmer June — 89
Resistance heating units are adaptable. Norman Peach Mar. — 174
The role of NGL in industry. W.W. Keeler (chart & table) Sept. — 82
Winterize cooling towers with electric heat. M. Epstein (charts & tables) Jan. — 59

HYDRO PLANTS AND EQUIPMENT
New Zealand's Tongariro: Hydro scheme with a difference. W.A. Scholes (maps) June — 88
PASNY stretches for new loads. Robert G. Schwieger (map & table) Nov. — 50

I

INDUSTRIAL POWER PLANTS
British steam-power plant will serve Esso refinery at Fawley. R.K. Evans (chart) Apr. — 70
General Electric's Lynn, Mass. plant: Fire-resistant fluid shows fresh promise as bearing lubricant for steam turbines. J.J. O'Connor Sept. — 80
Harvard Medical Center: Compact water heaters solve space problem July — 68
Industrial boilers - 8-page TD report. R.J. Bender (charts & table) May — 199
Man and his environment - 24-page special report (charts & tables) Oct. — 53
United States Military Academy: Graphite supports piping at West Point Aug. — 71
Westinghouse supplies on-site power for Garden State Paper Co. plant at Pomona, Cal. G.E. Baker Dec. — 43

INSTRUMENTS AND CONTROLS
Boiler codes should require inspection of complete systems, including controls. A.L. Kohan Mar. — 84
A guide to pressure gage selection. P.W. Harland (table) Nov. — 52
"High recovery": a factor in control valves. D.C. Tooley (charts) Dec. — 50
How can a poor closed-circuit TV image be improved? Energy system problem July — 164

INSULATION, ELECTRIC
Motors - a 32-page special report. Norman Peach (charts & tables) June — S-1
Sparks fly - what to do? S.H. Russ (P.I.) May — 180

INSULATION, HEAT
Cellular-glass insulation can save money in underground steam and return piping. L.M. Applegate Nov. — 59
Class F rating for industrial generators. P.L. Cochran (charts & tables) Mar. — 86
Hydrocarbon granules for pipe insulation. William O'Keefe Apr. — 86

Keep stored water hot with poured-inplace insulation of underground storage tanks. J.A. Thompsen July — 58

J

JAPAN
Lighting the nuclear lantern in Nippon - expansion plans through 1976. W.J. McCool (table, map) Mar. — 78
TEPCO to use LNG for its new plants Dec. — 63

L

LUBRICATION
Automated lube-oil purifiers can cut costs. William O'Keefe June — 82
Fire-resistant fluid shows fresh promise as bearing lubricant for steam turbines. J.J. O'Connor Sept. — 80
Oil won't flow in clear droplets - What would *you* have done? M.N. Segal (P.I.) Mar. — 181
Synthetics' dual role in lubrication (Ed.) Sept. — 59
What you should know about lubricant additives - 8-page TD report. R.C. Elliott (tables) Sept. — 201

M

MAINTENANCE METHODS
Accumulators - How can we check accumulators? — Energy system problem Mar. — 176
Air Conditioning
Beware of hydrogen gas. J.P. Snow (P.I.) Aug. — 158
How can we maintain rooftop package a-c units? - Energy system problem Nov. — 156
Bearings — Now our bearings last. C. Milster (P.I.) Aug. — 158
Boilers
Proper water treatment for industrial boilers cuts failures, reduces downtime. L. H. Vaughan (charts & tables) Nov. — 47
Washing boilers can be dangerous. J.G. Reed (chart) (P.I.) May — 180
What was wrong with No. 4 boiler? J.G. Reed (P.I.) Apr. — 183
Why did our boiler lose capacity? B. Zetchus (P.I.) Feb. — 147
Bolts: Protect stud with sleeve. E.J. Erwood (P.I.) June — 177
Cleaning
Automated lube-oil purifiers can cut costs. William O'Keefe June — 82
NaOH again, and again. M.M. Fromm (P.I.) Sept. — 180
Compressors
Epoxy resin is not the only answer to repairing compressor foundation. G. Rosekilly (P.I.) Jan. — 148
Use right check valve. H.O. Tibbitts. (P.I.) Nov. — 159
We never stop learning. B. Zetchus (P.I.) Apr. — 182
Condensers
Why was our condenser vacuum low? S. Ghoshal (chart) (P.I.) Mar. — 181
I don't agree . . . D.C. Johnson (P.I.) July — 166
Controls - Automatic blowdowns solved our problem. B. Zetchus. (P.I.) July — 166
Conveyors - We stopped belt jerking on our conveyor. V.K. Singhai (P.I.) Nov. — 160
Drawings: How do you handle piping and equipment drawing changes? — Energy system problem Aug. — 154
Ejector doesn't eject; check its nozzle. J.S. Crisi (chart) (P.I.) Mar. — 180
Electrical - Cable for dimmer switch., B. Zetchus (P.I.) July — 168
Engines — A hurricane emergency. T.A. Stewart (P.I.) Aug. — 156
Fans — Casing - What would *you* have done? B. Zetchus (P.I.) Sept. — 181
Gages — A guide to pressure gage selection. P.W. Harland (table) Nov. — 52
Generators
Another check point. R.J. Neiert (P.I.) Sept. — 182
We found that knock. C. Milster (P.I.) Nov. — 158
Heat Exchangers — Replace cracked heat exchanger with dummy. R. Ward (chart) (P.I.) Apr. — 182
Leak plug - Epoxy resin is not the only answer. G. Rosekilly (P.I.) Jan. — 148
Lighting — Rubber force cup to change bulbs — What would you have done? J.P. Arnoldy (P.I.) June — 177
Meters — O-ring saved $2500. C. Milster (P.I.) Sept. — 182
Motors
Moisture and motors don't mix. S. Nangia (P.I.) Apr. — 184
Tips on providing firm support for large motor drives. R.L. Nailen (chart) Sept. — 86
Why did our motors burn up? S. Ghoshal (P.I.) Feb. — 148
Piping
How can we seal off steam piping? - Energy system problem May — 178
Low water flow corrected. M.L. Bhatia (P.I.) Mar. — 182
Relocate branch line without interrupting production - What would *you* have done? M.E.A. Oestreicher (P.I.) Apr. — 183
Polyelectrolytes clear up mud problem at Ohio Steel Mill (chart) Dec. — 55
Preventive Maintenance — Make your own visual planning board. Bernard Zetchus Aug. — 76
Pumps
Are you prepared for emergency operation? C. Milster (P.I.) Aug. — 156
Stop "hammer" with air. W.R. Pender (P.I.) June — 178
Refrigeration — Ship runs aground; refrigeration stops - What would *you* have done? T.A. Stewart (P.I.) Feb. — 147
Stokers — What would *you* have done? J.G. Reed (P.I.) Aug. — 157
Storage — A space for pipe racks. C. Milster (P.I.) June — 177
Testing
New high-voltage test center aids cable development Aug. — 70
Watch how you test. T.A. Stewart (P.I.) Sept. — 180
"Third hand" holds handhole bolt. P.L. Finneral (P.I.) Apr. — 184
Third man theme. H.T. Livingston (P.I.) Aug. — 156
Turbines
Overcoming low vacuum in a turbo-generator set. S. Ghoshal (P.I.) May — 181
What would *you* have done? B. Zetchus (P.I.) Nov. — 159
Valves
Double check that check valve. B. Zetchus (P.I.) July — 167
About that check valve . . . L.J. Holman (P.I.) Dec. — 159
Second check valve . . . A. Basford (P.I.) Dec. — 159
Easy does it. L.T. Mullin (P.I.) Aug. — 157
Knock! Knock! Who's there? B. Zetchus (P.I.) June — 178
Put valve in tube. D.B. Saunders (P.I.) June — 176
"Scientific" method ends purger leak. B. Zetchus (P.I.) Feb. — 146
Water systems — Pressure-pump system permits inspection of HTW expansion drum. R. Lilly (charts) May — 76

MANAGEMENT
Central-Engineering Seminar probes plans and problems - 8-page EM report R.K. Evans (chart) Jan. — 165
European industry aims for worldwide markets — 8-page management report. R.K. Evans Nov. — 177
How did we fare in the '60's? (Ed.) Dec. — 39
How will you manage tomorrow? (Ed.) June — 67
Labor amid the challenge of boom (Ed.) Feb. — 55
Man and his environment — 24-page special report (charts & tables) Oct. — 53
Our visual setting - changes for the better. T.C. Elliott Oct. — 64
Managing nuclear fuel — 16-page special report. R.G. Schwieger (charts & tables) Dec. — S-1
Modern training techniques - 8-page TD report. R.J. Aberbach Feb. — 161
Pick your religion. B. Zetchus (P.I.) Sept. — 181

Marmaduke, Surfaceblow, see Surfaceblow, Marmaduke

MATERIALS
Cement-hardening liquid block leaks. G. Rosekilly (P.I.) Jan. — 148
Class F rating for industrial generators. P.L. Cochran (charts & tables) Mar. — 86
Concrete reactor vessels are coming to U.S.; Fort St. Vrain (Colorado) will use PCRV. T.E. Northup (table) Feb. — 76
A dam's best friend - diamonds. P. Silveri (P.I.) Jan. — 150
Desalination - why water desalting will expand - 8-page TD report. R.J. Bender (charts) Aug. — 171
Fiber-glass pipe goes underground June — 80
Graphite supports above-ground piping May — 30
Graphite supports piping at West Point Aug. — 71
Hydrocarbon granules for pipe insulation. William O'Keefe Apr. — 86
Innovation keynotes modern water treatment - 8-page TD report. R.J. Aberbach(table) July — 181
Lead, a versatile and flexible noisecutting aid Aug. — 62
Piping materials - Piping report. William O'Keefe (charts) Mar. — S-4
Sodium as a coolant for nuclear plants. E.B. Ash (charts & tables) Feb. — 70
Sodium hydroxide melts slide rule's aluminum parts. W.R. Pender (P.I.) Mar. — 182

MATERIALS HANDLING
Deaerator installation - Easy does it. M.L. Williams (P.I.) Feb. — 146
Storing liquefied natural gas: is there an economical way? Jan. — 77

MATHEMATICS
Probability mathematics can be used to evaluate power-system reliability. Norton Savage (chart & tables) May — 72
Short-circuit calculations. Irwin Lazar (charts & tables)
Fundamental considerations of fault calculation Feb. — 74
How short-circuit currents behave Apr. — 76
How to apply the per-unit method to short-circuit current calculations Aug. — 72
Calculating industrial short-circuit currents Dec. — 56
"Six-tenths" factor gives cost change. J.D. Constance (chart) Sept. — 89
Trial-and-error math solves the seemingly unsolvable. H.J.A. Wright (charts & table) Apr. — 74
Use your sliderule. D.S. Davis (P.I.) June — 178

MECHANICAL TRANSMISSIONS
Flexible shafts take mechanical drive power through crowded spaces. W. O'Keefe Aug. — 64
Verify engine alignment before operating. G.D. Pheil May — 81
Why spotty wear on V-belt pulleys? - Energy system problem June — 174

MOTORS AND MOTOR CONTROL
Do NEMA's new T-line standards meet users' needs? Norman Peach (charts & table) Mar. — 71
Frame numbers for 3-phase a-c motors. P.A. Werkheiser (Data Sheet) May — 124
Let's take a look at power factor. J. Alacchi (charts) Dec. — 52
Motor drives: Tips on providing firm support for large motor drives. R.L. Nailen (chart) Sept. — 86
Motors - 32-page special report. Norman Peach (charts & tables) June — S-1
Mounting data for 3-phase ac motors. P.A. Werkheiser (Data Sheet) June — 118
Why did our motors burn up? S. Ghoshal (P.I.) Feb. — 148
Why growth of ac adjustable speed? D.F. Grubb (charts & table) Nov. — 43

N

NEW ZEALAND
Tongariro project: Hydro scheme with a difference. W. A. Scholes (maps) June — 88

NOISE
Lead, a versatile and flexible noise-cutting aid Aug. — 62
Man and his environment — 24-page special report (charts & tables) Oct. — 53
Know the necessary steps to combat noise. Hoover & Ver Oct. — 70
Power plants abroad stress noise control — World Energy Conference (chart & table) Mar. — 88

NUCLEAR NOTES
Nuclear notes. R.J. Bender Jan. 98, Feb. 98, Mar. 110, Apr. 130, May 120, June 114, July 114, Aug. 108, Sept. 104, Oct. 77, Nov. 102 Dec. — 86

NUCLEAR POWER
Britain's nuclear future — a bright outlook. R. K. Evans (map) June — 71
Concrete reactor vessels to debut in U.S. at Fort St. Vrain; PCRV's in Europe. T.E. Northup (table) Feb. — 76
Consumers Power's Palisades plant: steel pipe draws cooling water from lake bottom 3300 ft from shore July — 73
Double-end-weld penetration assemblies upgrade reactor containment reliability. D.K. Sorensen Sept. — 72
Europe plans to enrich nuclear fuel commercially July — 56
European industry aims for worldwide markets — 8-page management report. R.K. Evans Nov. — 177
German nuclear industry shows immense progress. Kurt Jaroschek (map) Jan. — 72
Isolation valves contribute to BWR safety Apr. — 85
Japan brightens its nuclear lantern — expansion plans through 1976. W.J. McCool (table, map) Mar. — 78
Man and his environment — 24-page special report (charts & tables) Oct. — 53
Radioactivity: burden from a boon. S.D. Strauss Oct. — 66
Managing nuclear fuel — 16-page special report. R.G. Schwieger (charts & tables) Dec. — S- 1
Niagara Mohawk's Nine Mile Point — Making a storage pool leak-tight Feb. — 79
1969 Energy Systems Design Survey (charts & tables) Oct. — S- 1
Design features Oct. — S-10
Delays cut U.S. reactor orders, Europe expands technology Oct. — S-12
Nuclear notes. R.J. Bender Jan. 98, Feb. 98, Mar. 110, Apr. 130, May 120, June 114, July 114, Aug. 108, Sept. 104, Oct. 77, Nov. 102 Dec. — 86
Nuclear safety can be overplayed (Ed.) Aug. — 53
PASNY stretches for new loads. R.G. Schwieger (map & table) Nov. — 50
Plan well for a nuclear operating license. G.K. Rhodes (tables) Sept. — 76
Quality assurance assures quality in nuclear and other installations; a job for special-

ists. E.M. Marselli (chart) ..... Apr. — 82
Safety has been a paramount design concern of the nuclear community; a review of the record. S.D. Strauss (charts) ..... May — 70
Sodium — the coolant for fast breeder reactors of tomorrow. E.B. Ash (charts & tables) ..... Feb. — 70
Standby diesels improve reactor safety with electric backup for key auxiliaries. R.J. Bender (charts) ..... May — 65
Sweden is shifting its nuclear emphasis. S.D. Strauss (charts & table) ..... Jan. — 70
Tooling up for nuclear power. W. O'Keefe ..... July — 62
Training nuclear engineers: a fine theory-hardware mix. R.J. Aberbach ..... Aug. — 57
U.S. nuclear industry: healthy and still growing. E.B. Tremmel (charts) ..... Jan. — 68
Who writes nuclear codes and standards? — ASME symposium. R.J Bender ..... Mar. — 82

O

ODOR CONTROL
Man and his environment — 24-page special report (charts & tables) ..... Oct. — 53
Odors — more nuisance than health threat. T. C. Elliott ..... Oct. — 64

OIL BURNING AND HANDLING
Changing from coal to oil or gas? R. W. Marshall (table) ..... Dec. — 62
El besh mohandis kanadi — a Cairo story. B. Zetchus (P.I.) ..... Mar. — 180

P

PACKING, GASKETS AND SEALS
How can we seal off steam piping? — Energy system problem ..... May — 178
Improve cooling-tower performance with more efficient fill. R. Burger (charts) ..... Feb. — 67

PERSONAL IMPROVEMENT
We never stop learning. B. Zetchus (P.I.) Apr. — 182

PIPING
Cellular-glass insulation can save money in underground steam and return piping. L.M. Applegate ..... Nov. — 59
Consumers Power's Palisades plant: steel pipe draws cooling water from lake bottom 3300 ft from shore ..... July — 73
Fiber-glass pipe goes underground ..... June — 80
Graphite supports above-ground piping ..... May — 80
Graphite supports piping at West Point ..... Aug. — 71
Guidelines for central plant cooling. M.L. Hoglund (tables) ..... June — 84
How do you handle piping and equipment drawing changes? — Energy system problem ..... Aug. — 154
How can we seal off steam piping? — Energy system problem ..... May — 178
Hydrocarbon granules for pipe insulation. William O'Keefe ..... Apr. — 86
Piping — 24-page special report. William O'Keefe (charts & tables) ..... Mar. — S- 1
Codes ..... Mar. — S- 2
Materials ..... Mar. — S- 4
How pipe is made ..... Mar. — S-10
Designing the system ..... Mar. — S-12
Joining piping ..... Mar. — S-20
Nondestructive testing ..... Mar. — S-24
Piping's pressure forces can injure equipment. W.E. Pickard ..... July — 67
Pipeline tracing with SECT may save money. D. F. Othmer ..... June — 89
Polyelectrolytes clear up mud problem at Ohio Steel Mill (chart) ..... Dec. — 55
Problem of sloping pipelines. H.T. Livingston (P.I.) ..... Sept. — 180
Underground oxygen line: New use for coffee cans. J.P. Arnoldy (P.I.) ..... Nov. — 160

POWER (magazine)
Energy-System: Engineering Seminars — history of POWER's Seminars (Ed.) ..... Jan. — 55

Power Services see Energy Systems Design

Process steam see Steam

PUMPS
Charting booster-pump systems. K.G. Oliver (charts) Pt. 1 Apr. 67, ... Pt. 2 May — 82
Control-system pump motor conks out — What would you have done? M.L. Williams (P.I.) ..... Jan. — 149
How to determine pump horsepower and type. H.W. Hamm (Data Sheet) (nomogram) Jan. — 100
Piping's pressure forces can injure equipment. W.E. Pickard ..... July — 67
Pressure-pump system permits inspection of HTW expansion drum. R. Lilly (charts) May — 76
Stop "hammer" with air. W. R. Pender (P.I.) ..... June — 178
Water hydraulic systems have their place. William O'Keefe ..... Aug. — 60
We stopped wasting steam from our sump. C. Milster (P.I.) ..... Sept. — 182
What causes this b-f pump to draw excessive power? — Energy system problem ..... Dec. — 154

R

REFRACTORIES
Some tips on refractory practice. B. Zetchus (P.I.) ..... May — 180

REFRIGERATION
Ship runs aground; refrigeration stops — What would you have done? T. A. Stewart (P.I.) ..... Feb. — 147

RESEARCH
A dam's best friend — diamonds. P. Silveri (P.I.) ..... Jan. — 150
Research helps cut Britain's power costs. R.K. Evans ..... Dec. — 60

RUSSIA
75-MW MHD power plant near Moscow nears completion. R.K. Evans (chart) ..... Jan. — 66
Siberia's gas and oil fields are tougher than Alaska's. Jack Winkler ..... Sept. — 84

S

SAFETY
Improving nuclear reactor safety with standby diesels. R.J. Bender (charts) ..... May — 65
Industrial boilers — 8-page TD report. R.J. Bender (charts & table) ..... May — 199
Isolation valves contribute to BWR safety ..... Apr. — 85
Man and his environment — 24-page special report (charts & tables) ..... Oct. — 53
The nuclear industry has made design for safety a paramount concern; a review of the record; S.D. Strauss (charts) ..... May — 70
Nuclear safety can be overplayed (Ed.) ..... Aug. — 53
Pole fires stopped. C. Dandrow (P.I.) ..... May — 181
Quality assurance assures quality in nuclear and other installations: a job for specialists. E.M. Marselli (chart) ..... Apr. — 82

SPEAKING OF POWER (A DEPT)
Jan. 2, Feb. 2, Mar. 2, Apr. 2, May 2, June 2, July 2, Aug. 2, Sept. 2, Oct. 2, Nov. 2 ..... Dec. — 2

SPECIFICATIONS
Piping codes and specifications — Piping report. William O'Keefe (chart) ..... Mar. — S- 2

STACKS
Check stack size during fuel conversion. C.M. Sallman (chart) ..... July — 57
Six-second blast topples stack in carefully measured fall: pre-shooting did the trick ..... Sept. — 67

STANDARDIZATION
Boiler codes should require inspection of complete systems. A.L. Kohan ..... Mar. — 84
Man and his environment — 24-page special report (charts & tables) ..... Oct. — 53
Water reclamation and reuse team up to combat water pollution. R.J. Aberbach ..... Oct. — 57
Radioactivity: burden from a boon. S. D. Strauss ..... Oct. — 66
Motors — 32-page special report. Norman Peach (charts & tables) ..... June — S- 1
Motors — Do NEMA's new T-line standards meet users' needs? Norman Peach (charts & table) ..... Mar. — 71
Piping codes and specifications — Piping report. William O'Keefe (chart) ..... Mar. — S- 2
Who writes nuclear codes and standards? — ASME symposium. R.J. Bender ..... Mar. — 82

STEAM
British steam-power plant will serve Esso refinery at Fawley. R.K. Evans (chart) ..... Apr. — 70
Graphite supports piping at West Point ..... Aug. — 71
Harvard Medical Center: Compact water heaters solve space problem ..... July — 68
1969 Energy Systems Design survey (charts & tables)
Pollution control, automation, show increase for industrial boilers ..... Oct. — S-26
Design features ..... Oct. — S-28
Successful incinerators are not cheap. ..... Sept. — 78
Unfired generator meets new steam demand — packaged unit also trims operating costs. R.N. Clark & others ..... Jan. — 76

STOKERS
What would you have done? J.G. Reed (P.I.) ..... Aug. — 157

SUBSTATIONS AND SWITCHGEAR
Arcing faults: a fresh look. W.F. Bennett (chart) ..... Feb. — 59

SURFACEBLOW, MARMADUKE
Dr. Surfaceblow's six instruments ..... Apr. — 168
Marmaduke sets a trap ..... May — 166
Marmy's dead sea scrolls ..... Feb. — 128
Marmy doubles up ..... Nov. — 142
Marmy's Hurrican Hilda ..... Jan. — 136
Marmy's mell-of-a-hess ..... Dec. — 138
Marmy's mission to Jujuy ..... July — 152
Marmy's morning sickness ..... Mar. — 162
Marmy raises Tecumseh ..... June — 162
Marmy's stubborn pump — A TV play in three acts ..... Aug. — 144
Marmy's thermos bottle ..... Sept. — 150

SWEDEN
Environmental control system is economical (chart) ..... Jan. — 73
Sweden is shifting its nuclear emphasis. S.D. Strauss (charts & table) ..... Jan. — 70

Systems Design see Energy Systems Design

T

TANKS AND PRESSURE VESSELS
Flush-box floats: What would you have done? B. Zetchus (P.I.) ..... July — 167
Keep stored water hot with poured-in-place insulation of underground storage tanks J. A.Thompsen ..... July — 58
What happened to our water pressure? I don't agree. T.D. Ellis (P.I.) ..... Jan. — 149

TRAINING
Modern training techniques — 8-page TD report. R.J. Aberbach ..... Feb. — 161
Nuclear engineer training: a fine theory-hardware mix. R.J. Aberbach ..... Aug. — 57

TRANSFORMERS
Is lightning responsible for our transformer failures? — Energy system problem ..... Jan. — 146
Let's take a look at power factor. J. Alacchi (charts) ..... Dec. — 52

TRAPS AND STEAM SPECIALTIES
Hot returns? Not now. C. Milster (P.I.) ..... July — 166
Humidifiers that work ..... July — 168
We built our own air traps. R.N. Bhatnagar (P.I.) ..... Feb. — 147

TURBINES, GAS
European industry aims for worldwide markets — 8-page management report. R.K. Evans ..... Nov. — 177
Is your turbocharged engine working at peak efficiency? W.M. Kauffmann (chart) ..... Feb. — 63
Know bmep — the key to high engine output. W. M. Kauffmann (charts) ..... Nov. — 56
"Look Maw, no compressor". C. Dandrow (P.I.) ..... Feb. — 148
1969 Energy Systems Design Survey (charts & tables)
Gas turbines progress steadily both in utilities and industrial plants ..... Oct. — S-20
Design features ..... Oct. — S-22
Recovery turbines enhance economics of gas-washing plants. Schneider & Franzke ..... Sept. — 68
Westinghouse supplies on-site power for Garden State Paper Co. plant at Pomona, Cal. G. E. Baker ..... Dec. — 43

TURBINES, HYDRAULIC
Hydraulic-turbine horsepower and type. H.W. Hamm (Data Sheet) (nomogram) ..... Feb. — 100

TURBINES, STEAM
European industry aims for worldwide markets — 8-page management report. R.K. Evans ..... Nov. — 177
Fire-resistant fluid shows fresh promise as bearing lubricant for steam turbines. J.J. O'Connor ..... Sept. — 80
1969 Energy Systems Design Survey (charts & tables)
Steam-turbine-in-plant electric generation: Design features ..... Oct. — S-32
What would you have done? B. Zetchus (P.I.) ..... Nov. — 159

V

VALVES
Double check that check valve. B. Zetchus (P.I.) ..... July — 167
About that check valve... L.J. Holman (P.I.) ..... Dec. — 159
Second check valve... A. Basford (P.I.). ..... Dec. — 159
"High recovery": a factor in control valves. D. C. Tooley (charts) ..... Dec. — 50
How can we seal off steam piping? — Energy system problem ..... May — 178
Isolation valves contribute to BWR safety ..... Apr. — 85
Knock! Knock! Who's there? B. Zetchus (P.I.) ..... June — 178
Machine taps in butterfly valves on line ..... Dec. — 48
Not another check valve. R. E. Wheeler ..... Nov. — 160
Recirculation problem solved with air-operated valves. P. Hahn (P.I.) ..... June — 176
Use right check valve. H. O. Tibbitts. (P.I.) ..... Nov. — 159
We built our own air traps. R.N. Bhatnager (P.I.) ..... Feb. — 147

VIBRATION
Tips on providing firm support for large motor drives. R. L. Nailen (chart) Sept. — 86

W

WASTE DISPOSAL
Glossary of water and waste engineering terms (Data Sheets) Pt. 1 July 116, Pt. 2 Aug. 110, Pt. 3 Sept. 106, Pt. 4 Oct. — 134
Man and his environment — 24-page special report (charts & tables) Oct. — 53
Water reclamation and reuse team up to combat water pollution. R. J. Aberbach Oct. — 57
Thermal effects compound overall problem. R. J. Aberbach Oct. — 60
The mounting problem of solid wastes. E. R. Kaiser Oct. — 62
Radioactivity: burden from a boon. S. D. Strauss Oct. — 66
Air pollution by waste conservation. Norman Peach Oct. — 74
Successful incinerators are not cheap. Sept. — 78
When 'further study' is a camouflage (Ed.) Nov. — 39

WASTE TREATMENT
Glossary of water and waste engineering terms (Data Sheets) Pt. 1 July 116, Pt. 2 Aug. 110, Pt. 3 Sept. 106 Pt. 4 Oct. — 134
Man and his environment — 24-page special report (charts & tables) Oct. — 53
Water reclamation and reuse team up to combat water pollution. R.J. Aberbach Oct. — 57
Thermal effects compound overall problem. R. J. Aberbach Oct. — 60
The mounting problem of solid wastes. E. R. Kaiser Oct. — 62
Radioactivity: burden from a boon. S.D. Strauss Oct. — 66
Air pollution by waste conservation. Norman Peach Oct. — 74

WATER CONDITIONING
Britain's largest automatic feedwater demineralizing system installed at Fawley refinery power plant. R.K. Evans (chart) Apr. — 70
Continuous demineralizing for boiler feed. Charles Thorborg (tables) June — 76
Continuous exchange cuts soft-water cost. Gerald Alexander (chart) Jan. — 74
Desalination — why water desalting will expand — 8-page TD report. R. J. Bender (charts) Aug. — 171
A desalting process with potential — the vapor-compression cycle. A.R. Shouman (charts) May — 68
Glossary of water and waste engineering terms (Data Sheets) Pt. 1 July 116, Pt. 2 Aug. 110, Pt. 3 Sept. 106 Pt. 4 Oct. — 134
How can we stop cooling-tower corrosion-inhibitor pollution? — Energy system problem Sept. — 176
Innovation keynotes modern water treatment — 8-page TD report. R.J. Aberbach (table) July — 181
Liquid alum makes progress for coagulation. C.P. Roddy (charts) May — 84
Low-cost chemical feeder. C. Milster (P.I.) May — 182
Man and his environment — 24-page special report (charts & tables) Oct. — 53
Water reclamation and reuse team up to combat water pollution. R.J. Aberbach Oct. — 57
Thermal effects compound overall problem. R. J. Aberbach Oct. — 60
The mounting problem of solid wastes. E. R. Kaiser Oct. — 62
Radioactivity: burden from a boon. S. D. Strauss Oct. — 66
Air pollution by waste conservation. Norman Peach Oct. — 74
Polyelectrolytes clear up mud problem at Ohio Steel Mill (chart) Dec. — 55
Proper water treatment for industrial boilers cuts failures, reduces downtime. L.H. Vaughan (charts & table) Nov. — 47
User survey evaluates sidestream filters. R. Parlante (charts & table) Mar. — 75
Water consumption ratio in barometric condensers. A. Zanker (Data Sheet) (nomograph) Nov. — 104
What causes this b-f pump to draw excessive power? — Energy system problem Dec. — 154
When 'further study' is a camouflage (Ed.) Nov. — 39
Why was the cooling water cold, then hot? S. Ghoshal (chart) (P.I.) Jan. — 148

WATER SUPPLY
Consumers Power's Palisades plant: steel pipe draws cooling water from lake bottom 3300 ft from shore July — 73
Desalination — why water desalting will expand — 8-page TD report. R.J. Bender (charts) Aug. — 171
A desalting process with potential — the vapor-compression cycle. A.R. Shouman (charts) May — 68
Fiber-glass-reinforced polyester pipe to carry make-up water June — 80
Guidelines for central plant cooling. M.L. Hoglund (tables) June — 84
Keep stored water hot with poured-in-place insulation of underground storage tanks. J. A. Thompsen July — 58
Machine taps in butterfly valves on-line Dec. — 48
Man and his environment — 24-page special report (charts & tables) Oct. — 53
Water reclamation and reuse team up to combat water pollution. R.J. Aberbach Oct. — 57
Thermal effects compound overall problem. R. J. Aberbach Oct. — 60
The mounting problem of solid wastes. E. R. Kaiser Oct. — 62
Radioactivity: burden from a boon. S. D. Strauss Oct. — 66
Air pollution by waste conservation. Norman Peach Oct. — 74
Pressure-pump system permits inspection of HTW expansion drum. R. Lilly (charts) May — 76
When 'further study' is a camouflage (Ed.) Nov. — 39

WELDING
Double-end-weld penetration assemblies upgrade reactor containment reliability. D.K. Sorensen Sept. — 72
Pipe-welding — Piping report. William O'Keefe (chart) Mar. — S-20
Welding with short cables. T. Mullins (P.I.) Dec. — 158

AUTHOR'S INDEX

Aberbach, Robert J.
Man and his environment
Water reclamation and reuse team up to combat water pollution Oct. — 57
Thermal effects compound the overall problems Oct. — 60
Modern training techniques Feb. — 161
Training nuclear engineers: A fine theory-hardware mix Aug. — 57
Water treatment July — 181
Acland, K.
Energy system problem Nov. — 157
Alacchi, J.
Let's take a look at power factor Dec. — 52
Alexander, Gerald
Continuous exchange cuts soft-water cost Jan. — 74
Amelch, G.
Energy system problem Mar. — 177
Angerer, W. L.
Energy system problem Aug. — 155
Applegate, Lindsay M.
Cellular-glass insulation can save money in underground steam and return piping Nov. — 59
Arbuthnot, G.
Energy system problem Mar. — 177
Arnoldy, J. P.
Humidifiers that work July — 168
Underground oxygen line: New use for coffee cans Nov. — 160
What would you have done? June — 177
Ash, E. B.
Sodium as a coolant for nuclear plants Feb. — 70

Baker, G. E.
Electric utility supplies on-site power Dec. — 43
Basford, J.
My biggest boner Jan. — 150
Second check valve Dec. — 159
Becht, G. L.
Energy system problem Aug. — 155
Bender, Rene J.
Can the fuel cell bridge the gap? July — 70
Industrial boilers May — 199
Nuclear notes
Jan. 98, Feb. 98, Mar. 110, Apr. 130, May 120, June 114, July 114, Aug. 108, Sept. 104, Oct. 77, Nov. 102, Dec. — 86
Standby diesels improve reactor safety with electric backup for key auxiliaries May — 65
Who writes nuclear codes and standards? Mar. — 82
Why water desalting will expand Aug. — 171
Bennett, W. F.
Take a fresh look at arcing faults Feb. — 59
Bernard, C.
Energy system problem Nov. — 157
Best, J.
Energy system problem Apr. — 181
Bhatia, M. L.
Low water flow Mar. — 182
Bhatnagar, R. N.
We built our own air traps Feb. — 147
Black, R.
Energy system problem Mar. — 177
Boyer, A. E. & F. B. Kaylor
Can the cost of SO_2 pollution control be reduced? Apr. — 81
Computer simulates urban atmospheres July — 60
Bunting, R. V. & others
Unfired generator meets new steam demand Jan. — 76
Burger, Robert
How to improve cooling tower efficiency Feb. — 67
Burnett, P. R.
Energy system problem July — 164
Burnette, R. J.
Energy system problem Feb. — 145
Buss, J. R. & P. L. Tremont
Add dry surface to cooling towers? May — 79

Cheska, D. A.
Energy system problem May — 179
Clarke, R. N. & others
Unfired generator meets new steam demand Jan. — 76
Cochran, Paul L.
Class F rating for industrial generators Mar. — 86
Cole, C. R.
Energy system problem Dec. — 155
Constance, J. D.
"Six-tenths" factor gives cost change Sept. — 89
Copus, E. G.
Questions on Yarbrough's vibration article. (letter) Feb. — 148
Crisi, J. S.
When an ejector doesn't eject, check its nozzle Mar. — 180
Crown, D. F.
Energy system problem Nov. — 157
Cunningham, R. J.
Energy system problem Sept. — 177
Cupello, A.
Shutters cut off our coal supply Jan. — 150

Dandrow, C.
"Look, Maw, no compressor" Feb. — 148
We stopped fires May — 181
Davis, D. S.
Use your sliderule June — 178
Dawley, C. W.
Energy system problem July — 165
Driscoll, J. B.
How uninterrupted-power systems shape up Sept. — 63
Duzy, A. F. & N. P. Rusanowsky
Cyclone furnace passes high-moisture tests Feb. — 62

Elliott, Thomas C.
Design trends in industrial air conditioning Apr. — 197
Man and his environment
Odors — more nuisance than health threat Oct. — 64
Our visual setting — changes for the better Oct. — 68
What you should know about lubricant additives Sept. — 201
Ellis, T. D.
I don't agree Jan. — 149
Elonka, Steve
Northern Canada Power Commission
Achievements (1948-1967) in developing power plants in remote northern areas Apr. — 72
A cold winter is NCPC's biggest enemy Sept. — 65
Emerick, R. H.
My biggest boner... Mar. — 182
Epstein, M.
Winterize cooling towers with electric heat Jan. — 59
Erwood, E. J.
Protect stud with sleeve June — 177
Etheredge, K. W.
Energy system problem Dec. — 155
Evans, R. Keith
A bright outlook for Britain's nuclear future June — 71

Central-Engineering Seminar probes plans and problems Jan. — 165
Evans, R.K.
European industry aims for worldwide markets Nov. — 177
Man and his environment
Cooperation is the keynote to Europe's conservation agencies Oct. — 72
New steam-power plant for U.K. refinery Apr. — 70
Research helps cut Britain's power costs Dec. — 60
75-MW MHD power plant nears completion Jan. — 66

Field, E.L. & C.R. LaMantia
Tackling the problem of nitrogen oxides Apr. — 63
Finneral, P.S.
"Third hand" holds handhole bolt Apr. — 184
What would you have done? May — 181
Flower, A.A.
Energy system problem Jan. — 147
Ford, D.J.
Energy system problem Apr. — 181
Foster, M.E.
Dr. Surfaceblow's six instruments. Dec. — 160
Franzke, A. & F. Schneider
Recovery turbines enhance economics of gas-washing plants Sept. — 68
Fromm, M.M.
NaOH again, and again Sept. — 180

Gerstle, Richard W.
How much pollutant is discharged? Jan. — 63
Ghoshal, S.
Our vacuum was low May — 181
Why did our motors burn up? Feb. — 148
Why was our condenser vacuum low? Mar. — 181
Why was the cooling water cold, then hot? Jan. — 148
Graham, F.
My biggest boner . . . Nov. — 160
Grubb, D.F.
Why growth of ac adjustable speed? Nov. — 43

Hahn, P.
Recirculation problem solved with air-operated valves June — 176
Halkewycz, R. & others
Unfired generator meets new steam demand Jan. — 76
Hamm, H.W.
How to determine pump horsepower and type Jan. — 100
Hydraulic-turbine horsepower and type Feb. — 100
Harding, W.R.
Energy system problem Sept. — 179
Harland, Philip W.
A guide to pressure gage selection Nov. — 52
Havet, H.
My biggest boner . . . Dec. — 160
Haworth, F.R.
Energy system problem Feb. — 145
Hein, A.W.
Guide to combustion-air preheating Sept. — 70
Helwig, W.O.
Energy system problem Feb. — 144
Hennigan, D.
Energy system problem Nov. — 156
Hermans, A.J.
Energy system problem Aug. — 155
Hoglund, M.L.
Guidelines for central plant cooling June — 84
Holman, L.J.
About that check valve Dec. — 159
Hoover, R.M. & I.L. Ver
Man and his environment
Know the necessary steps to combat noise Oct. — 70
Hope, C.W.
Energy system problem Dec. — 155

Jaeger, H.H.
Energy system problem Aug. — 154
Jaroschek, Kurt
German nuclear industry shows immense progress Jan. — 72
Johnson, D.C.
I don't agree . . . July — 166
Jury, K.E.
Energy system problem Sept. — 176

Kaiser, Elmer R.
Man and his environment
The mounting problem of solid wastes Oct. — 62
Successful incinerators are not cheap Sept. — 78
Kaknics, E.
Energy system problems June — 174
Sept. — 179
Kauffmann, W.M.
Is your turbocharged engine working at peak efficiency? Feb. — 63
Know bmep — the key to high engine output Nov. — 56
Kaylor, F.B. & A.E. Boyer
Can the cost of SO_2 pollution control be reduced? Apr. — 81
Computer simulates urban atmospheres July — 60
Keeler, W.W.
The role of NGL in industry Sept. — 82
Kellstrom, A.A.
Choose assessories to optimize air system May — 86
Kohan, Anthony L.
Inspect boilers on a system basis Mar. — 84
Konopinski, V.J.
Energy system problem June — 173

LaMantia, C.R. & E.L. Field
Tackling the problem of nitrogen oxides Apr. — 63
LaPorte, R.K.
Energy system problem Dec. — 154
Larkin, T.L.
Energy system problem Sept. — 176
Latimer, D.F.
Energy system problem Jan. — 146
Lazar, Irwin
Short-circuit calculations
Fundamental considerations of fault calculation Feb. — 74
How short-circuit currents behave Apr. — 76
How to apply the per-unit method to short-circuit current calculations Aug. — 72
Calculating industrial short-circuit currents Dec. — 56
Leidolf, H.
Energy system problem May — 178
Lilly, R.
Pressure-pump system permits inspection of HTW expansion drum May — 76
Livingston, H.T.
Energy system problem Nov. — 156
Problem of sloping pipelines Sept. — 180
Third man theme Aug. — 156
Lokay, H.E. & S. Merry
Transient and dynamic stability studies Aug. — 66
Lythgoe, F.W.
Energy system problem Nov. — 157

Marselli, E.M.
How quality assurance assures quality in nuclear and other installations Apr. — 82
Marshall, Robert W.
Changing from coal to oil or gas? Dec. — 62
Martin, K.
Energy system problem June — 174
Marx, S.D.
Energy system problem Sept. — 177
May, J.
Energy system problem July — 165
McCool, Whittie J.
Lighting the nuclear lantern in Nippon Mar. — 78
McQuarrie, D.F.
Energy system problem May — 179
Merry, S. & H.E. Lokay
Transient and dynamic stability studies Aug. — 66
Messina, J.P.
Energy system problem Dec. — 154
Mikulski, B.
Energy system problem Apr. — 180
Milster, C.
Are you prepared for emergency operation? Aug. — 156
Hot returns? Not now July — 116
Low-cost chemical feeder May — 182
Now our bearings last Aug. — 158
A space for pipe racks June — 177
We stopped wasting steam from our sump Sept. — 182
Mogensen, N.
Energy system problem May — 178
Moore, R.
Energy system problem Mar. — 178
My biggest boner . . . . Apr. — 184
Morgan, A.L.
Energy system problem Mar. — 177
Mornach, D.A.
Energy system problem June — 174
Morrison, R.R.
Energy system problem Mar. — 178
Mullin, L.T.
Easy does it Aug. — 157
My biggest boner Aug. — 158
Use your head Aug. — 158
Welding with short cables Dec. — 158
Myers, M.L.
Energy system problems Mar. — 179, June — 172

Nailen, R.L.
Tips on providing firm support for large motor drives Sept. — 86
Nangia, S.
Moisture and motors don't mix Apr. — 184
Neiert, R.J.
Another check point Sept. — 182
Nies, J.
Energy system problem Sept. — 178
Northup, T.E.
Concrete reactor vessels are coming to U.S. Feb. — 76

O'Connor, James J.
Fire-resistant fluid shows fresh promise as bearing lubricant for steam turbines Sept. — 80
Oestreicher, M.E.A.
What would you have done? Apr. — 183
O'Keefe, William
Automated lub-oil purifiers can cut costs June — 82
Flexible shafts take mechanical drive power through crowded spaces Aug. — 64

Hydrocarbon granules for pipe insulation Apr. — 86
Piping Mar. — S-1
Tooling up for nuclear power July — 62
Water hydraulic systems have their place Aug. — 60
Oliver, K.G.
Charting booster-pump systems Pt. 1 Apr. — 67
Pt. 2 May — 82
Othmer, Donald F.
Pipeline tracing with SECT may save money June — 89

Parlante, R.
User survey evaluates sidestream filters Mar. — 785
Peach, Norman
Consider infrared for comfort heating July — 162
Do new motor standards meet users' needs? Mar. — 71
Electric heating has many applications Jan. — 144
Electric heating offers many techniques May — 176
Electromechanical brakes are reliable Dec. — 150
How to control electric heating Sept. — 174
Man and his environment
A cure for pollution by conserving waste Oct. — 74
Motors June — S-1
Resistance heating units are adaptable Mar. — 174
Pearson, A. F., Jr.
Energy system problem Aug. — 155
Peck, T.T.
Energy system problem June — 172
Pender, W.R.
Correcting engine alignment Dec. — 158
NaOH again? Mar. — 182
Stop "hammer" with air June — 178
Pheil, George D.
Verify engine alignment before operating May — 81
Pickard, W.E.
Piping's pressure forces can injure equipment July — 67

Raftery, R.
Energy system problem Sept. — 179
Rampolla, J.
Energy system problems June — 173, Aug. — 155
Reed, J.G.
Energy system problem Dec. — 155
Here's that fly ash again, boosting temperatures June — 176
Look out, take care July — 166
My biggest boner . . . July — 168
Washing boilers can be dangerous May — 180
What was wrong with No. 4 boiler? Apr. — 183
What would you have done? Aug. — 157
Reed, R.J.
Energy system problem Apr. — 180
Rhode, G.K.
Plan well for a nuclear operating license Sept. — 76
Richards, L.C.
Energy system problem June — 175
Robbins, A.M.
A compressor that wouldn't compress Nov. — 158
Roddy, C.P.
Progress in liquid alum for coagulation May — 84
Rosekilly, G.
Epoxy resin is not the only answer Jan. — 148
Rusanowsky, N.P. & A.F. Duzy
Cyclone furnace passes high-moisture tests Feb. — 62
Russ, S.H.
Sparks fly — what to do? May — 180

Sallman, C.M.
Check stack size during fuel conversion July — 57
Savage, Norton
Plant fuel cost per kW of capacity Mar. — 116
Use probability mathematics to evaluate power-system reliability May — 72
Schneider, F. & A. Franzke
Recovery turbines enhance economics of gas-washing plants Sept. — 68
Scholes, William A.
Hydro scheme with a difference June — 88
Schwieger, Robert G.
Managing nuclear fuel Dec. — S-1
PASNY stretches for new loads Nov. — 50
Singhai, V.K.
We stopped belt jerking on our conveyor Nov. — 160
Sisson, W.
Resistance of a conductor Dec. — 92
Sorensen, D.K.
Double-end weld penetration assemblies upgrade reactor containment reliability Sept. — 72
Scott, F.S.
Energy system problem June — 172
Segal, M.N.
What would you have done? Mar. — 181
Selden, M.G.
Energy system problem June — 173
Shanok, M.E.
Energy system problem Mar. — 176
Shouman, A.R.
A desalting process with potential May — 68
Silveri, P.
A dam's best friend — diamonds Jan. — 150
Slosson, R.F.
Energy system problem June — 175
Snow, J.P.
Beware of hydrogen gas Aug. — 158

Souder, A. M.
Energy system problem — Feb. — 144
Sounders, D. B.
Put valve in tube — June — 176
Spencer, A. G.
Energy system problem — Jan. — 146
Sprague, T. M.
Energy system problem — Jan. — 147
Stafford, T.
No slips now — Sept. — 180
Stamm, R. C.
Energy system problem — May — 178
Stasney, J. Jr.
Energy system problem — Sept. — 178
Steinmann, J.
Energy system problem — Mar. — 178
Stewart, T. A.
A hurricane emergency — Aug. — 156
Watch how you test — Sept. — 180
What would *you* have done? — Feb. — 147, Dec. — 159
Stinson, A.
Energy system problem — Feb. — 145
Strauss, Sheldon D.
Design for safety has been a paramount concern of the nuclear community — May — 70
Man and his environment
Radioactivity: burden from a boom — Oct. — 66
Sweden is shifting its nuclear emphasis — Jan. — 70
Sullivan, F. P.
Energy system problem — Jan. — 147
Sullivan, Russel E.
Motorola plant built in modules has added flexibility — Sept. — 74

Telford, P. K.
Energy system problem — Mar. — 177
Tesar, T.
Energy system problem — Mar. — 176
Thompsen, J. A.
Keep stored water hot with insulation — July — 58
Thorborg, Charles
Continuous demineralizing for boiler feed — June — 76
Tibbitts, H. O.
Use right check valve — Nov. — 159
Tooley, Day C.
"High recovery": a factor in control valves — Dec. — 50
Tremmel, E. B.
U. S. nuclear industry: healthy and still growing — Jan. — 68
Tremont, P. L. & J. R. Buss
Add dry surface to cooling towers? — May — 79

Vaughan, L. H.
Proper water treatment for industrial boilers cuts failures, reduces downtime — Nov. — 47
Ver, I. L. & R. M. Hoover
Man and his environment
Know the necessary steps to combat noise — Oct. — 70
Viscovich, P. W.
Rejected-heat effect on stream temperature — Apr. — 134

Ward, R.
Replace cracked heat exchangers with dummy — Apr. — 182
Wayne, H. D.
Energy system problems — Feb. 145, Mar. 176, 179, May 179, June 173, 175, July 164, — Sept. — 177
Wehner, J. L.
Energy system problem — Aug. — 154
Werkheiser, P. A.
Frame numbers for 3-phase a-c motors — May — 124
Mounting data for 3-phase ac motors — June — 118
Wheeler, R. E.
Not another check valve — Nov. — 160
Wiens, E.
Energy system problem — July — 164
Williams, M. L.
Easy does it — Feb. — 146
My biggest boner — May — 182
What would *you* have done? — Jan. — 149
Winkler, Jack
Siberia's gas and oil fields are tougher than Alaska's — Sept. — 84
Winship, G. E.
Energy system problem — Feb. — 145
Wright, Hilary J. A.
Trial-and-error math solves the seemingly unsolvable — Apr. — 75

Yarbrough, C. T.
Answer to letter's questions on vibration article — Feb. — 148

Zanker, A.
Water consumption ratio in barometric condensers — Nov. — 104
Zetchus, B.
Automatic blowdowns solved our problem — July — 166
Double check that check valve — July — 167
El besh mohandis kanadi — a Cairo story — Mar. — 180
Humidifiers that work — July — 168
Knock! Knock! Who's there? — June — 178
Make your own visual planning board — Aug. — 76
Pick your religion — Sept. — 181
The "scientific" method — Feb. — 146
Some tips on refractory practice — May — 180
We never stop learning — Apr. — 182
What would *you* have done? — July — 167, Sept. — 181, Nov. — 159
Why did our boiler lose capacity? — Feb. — 147